

CHAPTER 10

FINAL PREPARATION OF THE MISSILE

10-1. Installing the Missile on the Launcher

WARNING: The missile contains explosives. All applicable safety regulations will be strictly enforced. Where adjacent missiles are a hazard, a barrier will be provided for protection. Do not perform handling operations during electrical storms.

WARNING: Handling operations of the missile will be supervised by qualified explosives personnel who thoroughly understand the hazards and risks involved. A minimum number of personnel will be permitted on or near the work location, and quantities of explosive materials will be kept to a minimum. Spilled explosive materials will be immediately removed, and the area thoroughly decontaminated before work continues.

WARNING: Explosive components containing electrical wiring must be protected at all times from stray voltages or induced electrical currents. A CO fire extinguisher will be provided. Extreme care will be exercised when handling explosive components whose size or weight make handling difficult.

a. Make certain that the section control-indicator controls and switches are in the initial operating condition and the MISSILE HEAT switch is set to OFF.

Note. Do not perform *b* below for missiles 13684 and subsequent.

b. Remove the left equipment section access cover plate.

c. (Deleted)

Note. Perform *d*, *e*, and *f* below for missiles 10206 through 11935 and 13001 through 13683.

d. Insure that missile wiring harness connector P518A (view A, fig. 9-19) is connected to connector J518 on the missile distribution box.

CAUTION: Make certain that connectors P1X and P72A are installed in the dummy connectors, and that missile umbilical cable connectors P104A (6, fig. 9-21) and P105A (9) are properly installed in connectors J104A (5) and J105A (10) on the launching-handling rail (4) before performing *e* or *f* below.

e. Install the guidance set storage battery (missiles 10206 through 11935 and 13001 through 13683) as follows:

(1) (Deleted)

(2) Remove the truss-head screw, lock-washer, and flat washer that secure the loop clamp to the bracket on the missile structure.

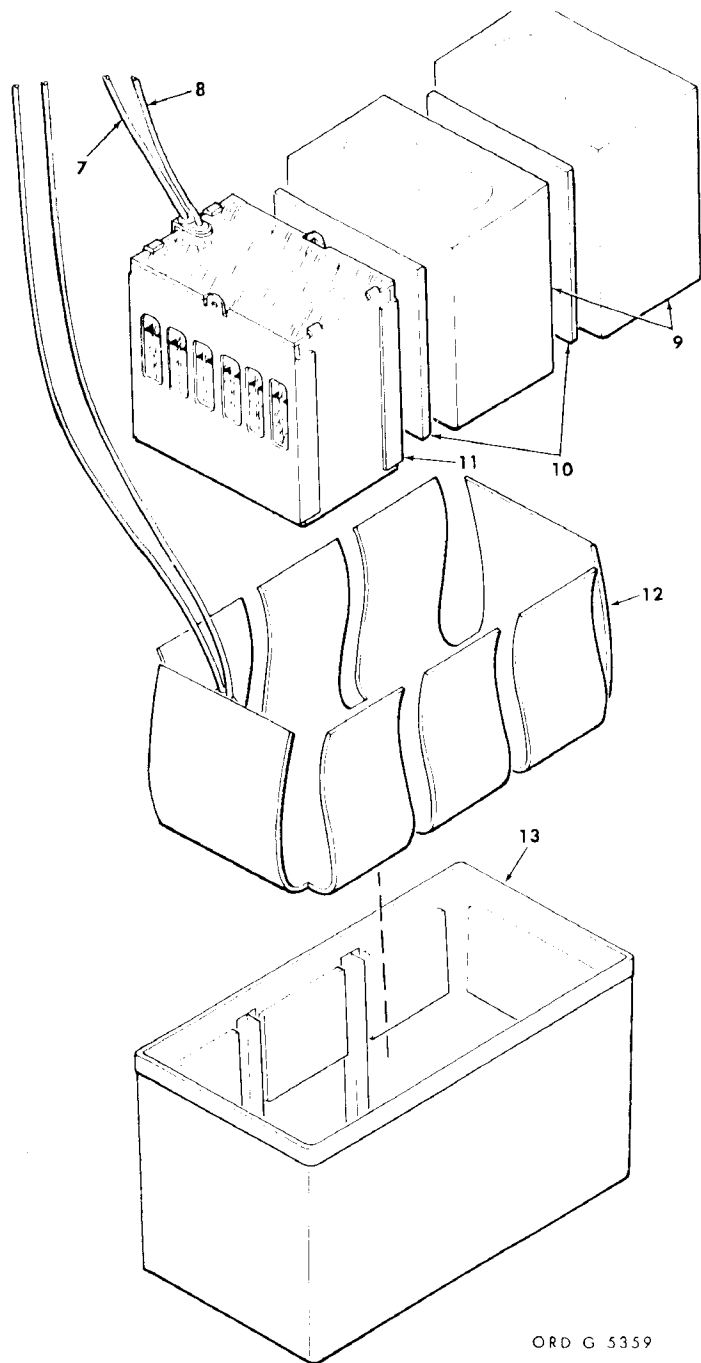
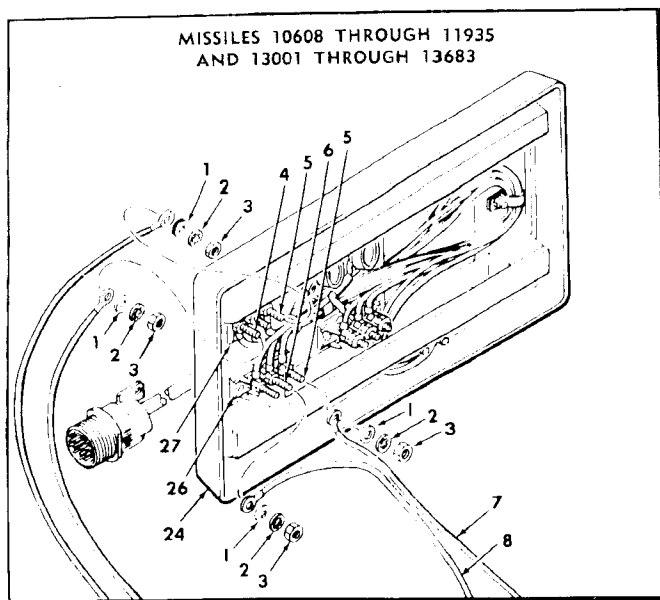
(3) Loosen the hose clamp on the battery drain hose. Disconnect the battery drain hose from the vent in the cover of the missile battery box.

(4) Remove the truss-head screws that secure the battery box straps; allow the straps to hang from the battery box support.

(5) Remove the battery box from the battery box support.

(6) Inspect connectors J510 and P510 to insure that they are correctly indexed, and that the pins of P510 match the corresponding receptacles in J510. Tape J510 to prevent damage.

CAUTION: Exercise care to prevent damage to the leads while performing (7) below.



ORD G 5359

- 1—0.149 in-id fl washer
- 2—No. 6 int-teeth lock washer
- 3—No. 6-32 hex nut
- 4—Terminal no 3
- 5—Terminal no 1
- 6—Terminal no 2
- 7—Red lead
- 8—Black lead
- 9—Dummy battery

- 10—Spacer
- 11—Guidance set storage battery
- 12—Heater assembly
- 13—Battery tray
- 14—Bracket
- 15— $\frac{1}{8}$ in-id fl washer (2)
- 16—No. 4-40 hex nut (2)
- 17—0.174 in-id fl washer
- 18—No. 8 lockwasher

- 19—No. 8-32 hex nut
- 20—Terminal board TB30
- 21—Terminal board TB31
- 22—Clamp
- 23—Thermostat S24
- 24—Battery box cover
- 25—No. 4-40 x 5 / 16 rd-hd screw (2)
- 26—Terminal board TB536
- 27—Terminal board TB537

Figure 10-1. Removal and installation of the guidance set storage battery (missiles 10206 through 11935 and 13001 through 13683).

(7) Remove the battery box cover (24, fig. 10-1) from the top of the battery tray (13).

Note. Use figure 10-2 for reference when connecting or disconnecting the storage batteries and heaters.

Note. Perform (8) through (11) below for missiles 10206 through 10607.

(8) Remove the roundhead screws (25, fig. 10-1), flat washers (15), and hexagon nuts (16) that secure the bracket (14) over terminal board TB31 (21); remove the bracket.

(9) Disconnect the lead of thermostat S24 (23) from terminal 1 (5) of terminal board TB31.

(10) Loosen the clamp (22) holding S24; remove the thermostat.

(11) Disconnect the lead of the heater assembly (12) from terminal 2 (6) of terminal board TB31.

(12) On missiles 10608 through 11935 and 13001 through 13683, disconnect the leads of the heater assembly from terminal 1 and terminal 3 of terminal board TB537 (27).

(13) Set the battery box cover aside.

(14) Remove the dummy batteries (9).

(15) Remove and inspect the heater assembly.

Note. Apply electrical insulating compound to the inner surfaces of the battery tray prior to installing the storage batteries or dummy batteries.

Note. If the vertical heater pads slide down when the storage batteries or dummy batteries are installed, tape the pads in position with masking tape.

(16) Position the heater assembly in the battery tray, but do not connect.

Note. The storage batteries must be serviced as prescribed in TM 11-6140-200-15 before performing (17) below.

(17) Place the guidance set storage battery (11) in the left end compartment of the battery tray, but do not connect.

(18) Place a dummy battery in each of the two remaining compartments.

(19) Install the battery spacers (10).

(20) On missiles 10608 through 11935 and 13001 through 13683, connect the leads of the heater assembly to terminal 1 (5) and terminal 3 (4) of terminal board TB537 (27). Secure each

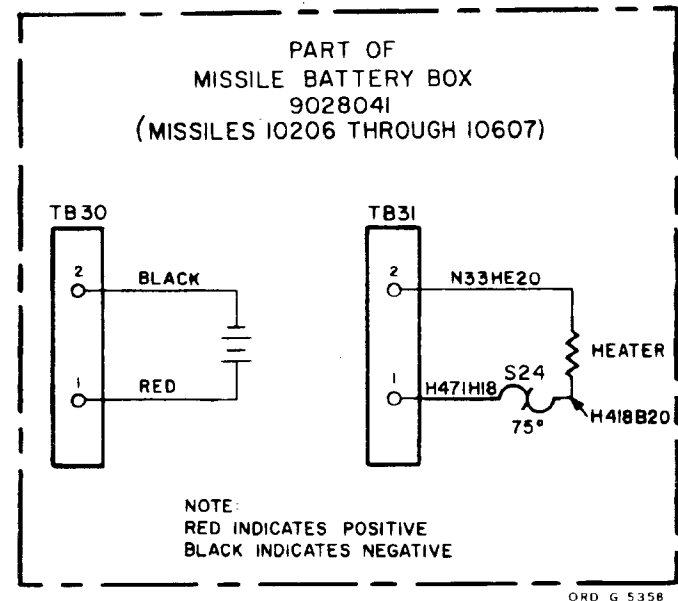
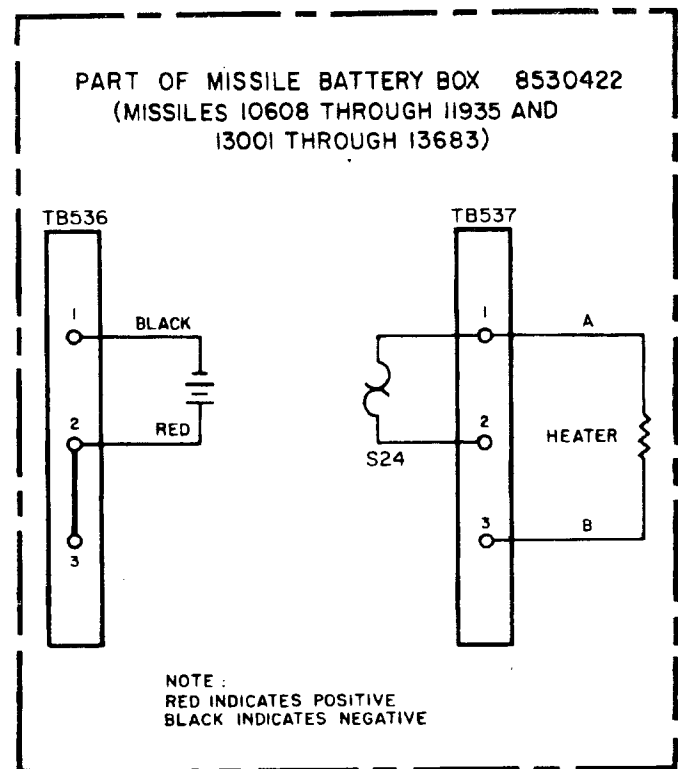


Figure 10-2. Guidance set storage battery and heater wiring schematic.

terminal with a flat washer (1), internal-teeth lockwasher (2), and hexagon nut (3).

Note. Perform (21) through (26) below for missiles 10206 through 10607.

(21) Connect the lead of the heater assembly to terminal 2 of terminal board TB31 (21), and secure with a flat washer (17), lockwasher (18), and hexagon nut (19).

(22) Place thermostat S24 in the clamp (22); tighten the clamp.

(23) Connect the lead of thermostat S24 to terminal 1 of terminal board TB31; secure with a flat washer (17), lockwasher (18), and hexagon nut (19).

(24) Install the bracket over terminal board TB31 with two roundhead screws (25), flat washers (15), and hexagon nuts (16).

Caution: Insure that the red (positive) and black (negative) terminals of the storage battery leads do not touch each other as they will fuse. The rubber terminal tips should be left on the terminals until the terminals are connected. After the connections are made, loop and tape the slack storage battery lead wire.

(25) Connect the black (negative) lead (8) of the guidance set storage battery to terminal 2 of terminal board TB30 (20); secure with a flat washer (17), lockwasher (18), and hexagon nut (19).

(26) Connect the red (positive) lead (7) of the storage battery to terminal 1 of terminal board TB30; secure with a flat washer, lockwasher, and hexagon nut.

Note. Perform (27) and (28) below for missiles 10608 through 11935 and 13001 through 13683.

(27) Connect the black (negative) lead (8) of the guidance set storage battery (11) to terminal 1 of terminal board TB536 (26); secure with a flat washer (1), internal-teeth lockwasher (2), and hexagon nut (3).

(28) Connect the read (positive) lead (7) of the storage battery to terminal 2 of terminal board TB536; secure with a flat washer, internal-teeth lockwasher, and hexagon nut.

Caution: Care should be exercised to prevent damage to the wires while performing (29) below.

(29) Place the battery box cover on the battery tray.

(3) Carefully place the missile battery box on the battery box support.

(31) Install the two battery box straps that secure the missile battery box to the battery box support with two truss-head screws.

(32) Connect the battery drain hose to the vent on the battery box cover; tighten the hose clamp.

(33) Position the loop clamp on the battery wiring harness, and secure to the bracket on the missile structure with truss-head screw, lockwasher, and flat washer.

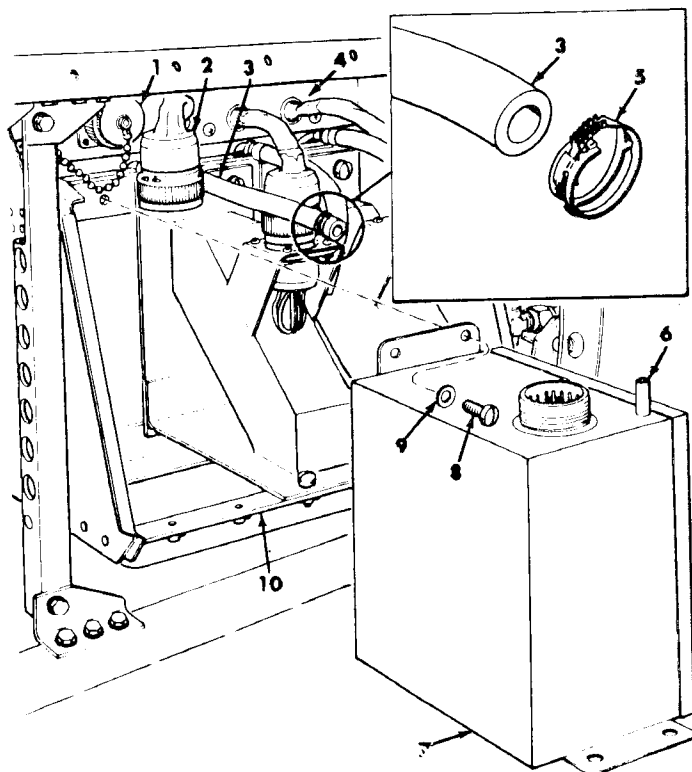
f. Connect connector J510 on the battery wiring harness to connector P510 on the missile distribution box.

g. (Deleted)

h. (Deleted)

i. (Deleted)

Warning: When connecting or disconnecting connectors P1X and P72A, the MAIN POWER BKR, MISSILE BATTERY HEAT, and BOOSTER HEAT circuit breakers at the launcher power distribution box for the appropriate launcher must be set



ORD G 5357

- 1—Connector P510
- 2—Connector P541
- 3—Battery drain hose
- 4—Component mounting panel
- 5—Hose clamp
- 6—Battery vent
- 7—Guidance set squib battery BA-472 / U, BA-472A / U, BA-472B / U, or BA-472C / U
- 8—No. 10-32 NF-2A x 5/8 fl-hd screw (4)
- 9—0.203 in-id fl washer (4)
- 10—Missile battery rack

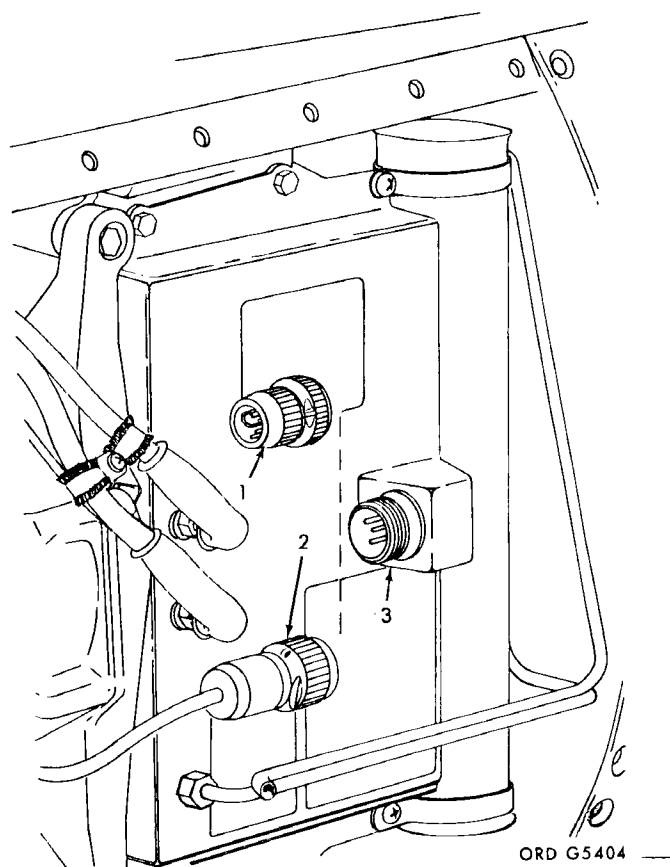
Figure 10-3. Removal and installation of the guidance set squib battery (missile 13684 and subsequent).

to OFF. Inspect connectors P1X, J1G, P72A, and J72D to assure that there is no moisture damage or foreign material present prior to connecting them.

j. Connect quick-disconnect connectors P1X and P72A (fig. 9-19) into launcher erecting beam connectors J1G and J72D respectively.

k. (Deleted)

l. Install the flathead screws (7 and 9) to secure the left equipment section access cover plate in position on the missile body. Tighten the screws to the torque value given in table 15-9.



ORD G5404

- 1—Shorting dummy connector
- 2—Connector P544
- 3—Connector J544

Figure 10-4. Removal and installation of the shorting dummy connector and connector P544.

m. Remove the flathead screws (fig. 11-1), and remove the IGNITOR access cover plate.

Warning: Check safety-and-arming switch S31 (fig. 5-13) for a safe indication. The green field is visible through the inspection window.

n. At the LCI, set the TEST-FIRE switch to TEST.

n.1. Set the MISSILE HEAT switch to the ON (up) position. The HEAT MONITOR indicator light extinguishes after the battery reaches operating temperature.

n.2. Set the LAUNCHER DC POWER switch to ON. The voltmeter indicates in the white area up to 30 volts.

Note. If the voltmeter does not contain a white zone, the indication shall be between 26.6 and 29.4 volts.

n.3. Set the HEATERS AND GYROS switch to ON. For missiles MIM-14A, ammeter indicates 3 to 6 after the initial surge. For missiles MIM-14B, ammeter indicates 7 to 9 after the initial surge.

n.4. Set the VIBRATOR switch to ON. For missiles MIM-14A, ammeter indicates 7 to 9 after a 60-second delay. For missiles MIM-14B, ammeter indicates 10 to 14 after a 60-second delay.

n.5. If the electrical circuit test set (8031099) is available, test the initiator wiring harness as follows.

(1) Check the electrical circuit test set as described in steps (a) through (o) below.

(a) Remove cable assembly 8031038 from the cabinet cover and connect the single end to the TEST connector (fig. 10-5) on the test set. Connect the SUSTAINER plug of the cable assembly to J5 on the electrical connector bracket assembly located in the cabinet cover.

(b) The test set must be within 5 degrees of horizontal during all tests. Hold the TEST ON switch to ON to obtain meter indications.

(c) Set SELF TEST, CONTINUITY, and STRAY V / DISCONT switches to OFF. Set the BATTERY EXTINT switch to INT.

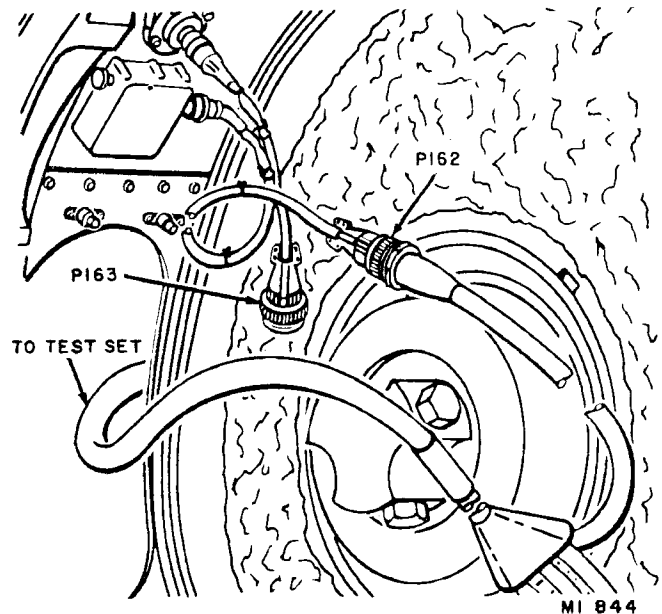


Figure 10-5. Stray voltage check and continuity test of the rocket motor initiator wiring harness.

Note. If the indications specified in d and e below cannot be obtained, replace the batteries.

(d) Set the SELF TEST switch to 1. Adjust BAT SUPPLY 1 variable resistor to obtain an indication of 0.5.

(e) Set the SELF TEST switch to 2. Adjust BAT SUPPLY 2 variable resistor to obtain an indication of 0.5.

(f) Set SELF TEST switch to 4. Adjust the METER ADJUST knob for an indication of 0.5.

(g) Set the SELF TEST switch to 5. The meter indicates between 0.48 and 0.52.

(h) Set the SELF TEST switch to 6. Adjust the METER ADJUST knob for an indication of 0.5.

(i) Set the SELF TEST switch to 7. The meter indicates between 0.49 and 0.51.

(j) Set the SELF TEST switch to OFF and the CONTINUITY switch to B. The meter indicates between 0.49 and 0.51.

Note. If any meter indication is not within tolerance in steps (g), (i), or (j), replace the test set. Refer an unacceptable test set to the proper authorities.

- (k) Adjust the METER ADJUST knob for an indication of 0.5 on the meter.
- (l) Set the CONTINUITY switch to A. Meter indicates between 0.2 and 0.4.
- (m) Set the CONTINUITY switch to V and the STRAY V/DISCONT switch to J. The meter indicates 0.
- (n) Disconnect the SUSTAINER plug from J5 on the electrical connector bracket assembly and leave it free. Leave the single end connected to TEST connector on the test set.

Note. If meter indication is not within tolerance in steps (l) and/or (m), replace the test set. Refer an unacceptable test set to the proper authorities.

- (o) Set the CONTINUITY and STRAY V/DISCONT switches to OFF.
- (2) Remove the ground strap and perform the stray voltage check and continuity test of the initiator wiring harness as described in steps (a) through (f) below. Steps 1a through o above must have been performed.

Warning: If the meter indication exceeds 0.5 in the following tests, do not connect P162 and P163 to J162 and J163 respectively. Refer the missile to the proper authorities.

- (a) Connect the SUSTAINER plug of cable assembly 8031038 to connector P162.
- (b) Set the CONTINUITY switch to A. Operate and hold the TEST ON switch to ON. The meter indicates between 0 and 0.5. Release the TEST ON switch.
- (c) Set the CONTINUITY switch to V and the STRAY V/DISCONT switch to J. Operate and hold the TEST ON switch to ON. The meter indicates between 0 and 0.5. Release the TEST ON switch.
- (d) Set the CONTINUITY and STRAY V/DISCONT switches to OFF.
- (e) Disconnect connector P162 from the SUSTAINER plug.
- (f) Repeat steps (a) through (e) above for connector P163.

- (g) Set all switches to OFF and return cable assembly 8031038 to its storage location.

n.6. If the electrical circuit test set is not available, test the initiator wiring harness with a multimeter as follows:

- (1) Check connector P162 for stray dc voltage between pins A and B, A and C, and B and C, and between each pin and the missile frame. The meter must indicate less than 0.3 volt.
- (2) Repeat step (1) above for connector P163.
- (3) Check connector P162 for stray ac voltage between pins A and B, A and C, and B and C, and between each pin and the missile frame. The meter must indicate less than 0.3 volt.
- (4) Repeat step (3) above for connector P163.
- (5) Check for continuity between pins A and B, A and C, and B and C on connector P162. The meter must indicate less than one ohm.
- (6) Repeat step (5) above for connector P163.

o. At the LCI, place the VIBRATOR, HEATERS AND GYROS, and LCHR DC POWER switches to OFF.

Warning: When connecting or disconnecting connectors P1X and P72A, the MAIN POWER BKR, MISSILE BATTERY HEAT, and BOOSTER HEAT circuit breakers at the launcher power distribution box for the appropriate launcher must be set to OFF.

o.1. Disconnect P1X and P72A and install them in the dummy receptacle.

Note. The three-terminal test lead may be used when performing the tests in steps q(1) through (10) below. If the test lead is used, perform the test in par. 10-5 c.1(2) prior to performing the initiator continuity tests.

Note. Do not use the two lead test cable 8020265 if the three lead test cable 8030966 is available when performing steps *q*(1) through (10) below. Prior to using the arming mechanism ohmmeter with 2-lead test cable 8020265, check the battery condition by shorting the ohmmeter terminals, using both test leads. If the maximum needle deflection is to the left of the 16-ohm graduation on the upper scale, the battery should be replaced. Any deflection to the right of the 16-ohm graduation should be considered a full-scale deflection when performing this test.

Caution: Handle the initiators carefully to avoid puncturing or damaging the foil seal on the base of the initiator.

p. Inspect the rocket motor initiators for bent or missing pins, corrosion, damaged threads, and punctured or damaged foil seals. If any of these conditions exist, reject the initiator.

Warning: Connect a grounding strap with a maximum resistance of 20 ohms from the frame of the portable barricade to a good earth ground.

q. Perform the continuity check of the rocket motor initiators, using the arming mechanism ohmmeter and a portable barricade in an authorized area as prescribed in steps (1) through (10) below.

- (1) Remove the initiator shorting connector from the initiator.
- (2) Clip the test leads to pins A and B of the initiator.
- (3) Open the sliding door on the portable barricade, and place the initiator in the barricade. Feed the test leads through the hole in the bottom of the barricade. Make sure that the test leads are not shorted.
- (4) Close the sliding door on the portable barricade.
- (5) Touch the test leads to the arming mechanism ohmmeter. The meter should indicate continuity.
- (6) Remove the test leads from the arming mechanism ohmmeter.
- (7) Open the sliding door on the portable barricade, and remove the initiator.
- (8) Repeat steps (2) through (7) above, using pins B and C, and pins A and C.

- (9) Install the initiator shorting connector on the initiator.
- (10) Repeat steps (1) through (9) above for each rocket motor initiator.

Note. Before proceeding with the installation of the rocket motor initiators, make certain that the test of the missile rocket motor initiator wiring prescribed in paragraphs 10-1 *n* through *n.6* has been performed.

Note. Access to the shipping plugs in step *r* below can be accomplished only by removing the IGNITOR access cover plate.

Warning: Do not attempt to adjust or remove the gas generator retaining ring (engine and adapter assembly ring) under any circumstances.

r. Reach through the forward end of the missile motor section, and remove the two ignitor shipping plugs (fig. 5-7) nearest the IGNITOR access cover plate.

Caution: Do not remove the shorting connectors from the missile rocket motor initiators at this time.

Note. Install a new gasket each time an initiator is loosened or removed.

s. Install a new gasket on each initiator.

t. Apply a coat of molybdenum disulfide lubricant to the threads of the initiators.

u. Install the two initiators with new gaskets in the gas generator where the shipping plugs were removed. Tighten the initiators to a torque value of 250 pound-inches.

v. Remove the two shorting connectors (5, fig. 5-15) from the two initiators in the gas generators.

w. Connect connectors P162 (3) and P163 (1) to the initiators.

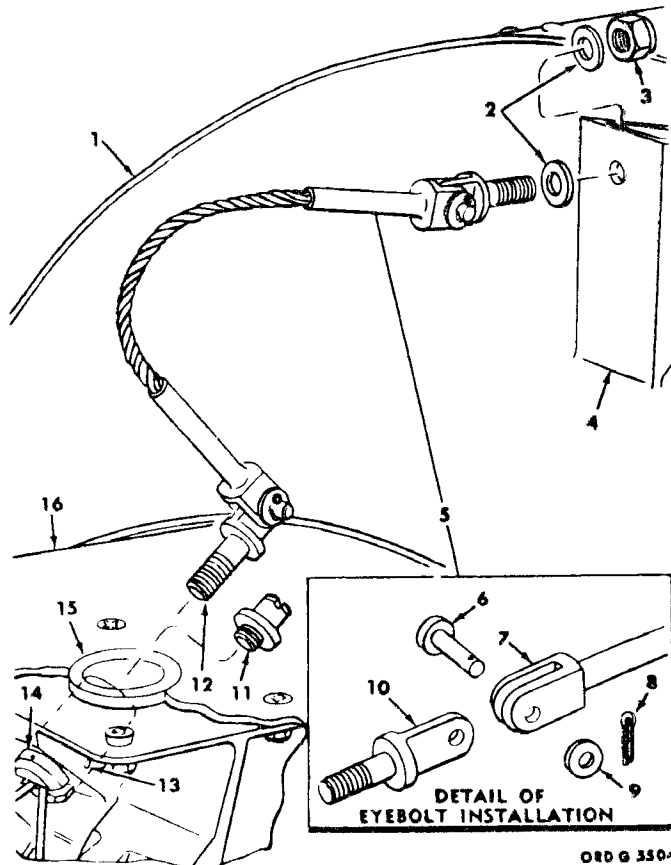
x. Recheck P162 and P163 for positive mechanical mating.

y. Install the flathead screws to secure the IGNITOR access cover plate (2, fig. 11-1) to the rear body section. Tighten the screws to the torque value prescribed in table 15-9.

z. Place the remaining gaskets and initiators in the container (fig. 5-14). Secure the container cover and store in the designated area.

10-2. Installation of the Propulsion Arming Lanyard

a. Remove and retain the shipping plug (11, fig. 10-6) from the trigger operating plug (14).



ORD G 3504

- 1—Rocket motor thrust ring assembly
- 2—0.265-in-id fl washer
- 3—1/4-28 hex nut
- 4—Lanyard mounting bracket
- 5—Lanyard assembly
- 6—3/16 x 17/32 fl-hd pin (2)
- 7—Lanyard
- 8—1/16 x 3/8 cotter pin (2)
- 9—0.203-in-id fl washer (2)
- 10—Eye bolt (2)
- 11—Shipping plug
- 12—Eyebolt
- 13—Aluminum rivet
- 14—Trigger operating plug
- 15—Lanyard receptacle
- 16—Missile body

Figure 10-6. Removal and installation of the propulsion arming lanyard.

Caution: The trigger operating plug is secured in position with an aluminum rivet (13). Do not use more than finger pressure to engage the threads of the eyebolt (12) with the threads in the trigger operating plug.

b. Apply antiseize compound to the threads of the eyebolt, and screw it into the trigger

operating plug approximately 10 complete turns, using finger pressure only.

Note. Position the eyebolts so that the plane of free movement for the lanyard assembly (5) is vertical to the missile skin.

Note. If the lanyard mounting bracket has two holes, insert the eyebolt through the upper hole when performing step c below.

c. Place a flat washer (2) on the remaining eyebolt, and insert it through the hole in the lanyard mounting bracket on the rocket motor thrust ring assembly (1).

Caution: Do not permit the lanyard assembly to rotate while performing step d below.

d. Install a flat washer (2) and a hexagon nut (3) on the eyebolt, and secure the lanyard assembly (5) to the lanyard mounting bracket (4).

10-3. Adjustment of the Missile-Away Switch

a. Move the missile-away switch arm (7, fig. 9-8) to the rear, by hand, until the missile-away switch produces an audible click. Hold the arm in this position, and advance the arm adjusting bolt (8) until the bolt contacts the rear retaining rail bar (10).

b. Advance the bolt an additional one-half turn. If at least one-half of the head of the bolt is not engaged with the rail bar, perform steps (1) through (3) below.

(1) Loosen the two hexagon-head bolts (6).

(2) Move the switch arm up.

(3) Tighten the bolts.

c. Hold the bolt to prevent turning, and tighten the locknut (9).

10-4. Installation of Rocket Motor Igniters M24A1, M65, or M69

a. Carefully examine each rocket motor igniter (fig. 10-7) for the presence of the shorting connector.

a.1. Inspect the igniter wiring harness for cracks, breaks and damaged, dirty, or corroded connector components. If any of these conditions exist, repair or replace the wiring harness. Wiring harness may be replaced on igniter M69 only.

b. Inspect the igniter for corrosion of metal parts, broken or cracked plastic closure cup, and damaged threads or loose terminals. Insure that there is no leakage of black powder from the plastic closure cup. If any of these condi-

tions exist, reject the igniter, and return it to the support unit for correction of defects.

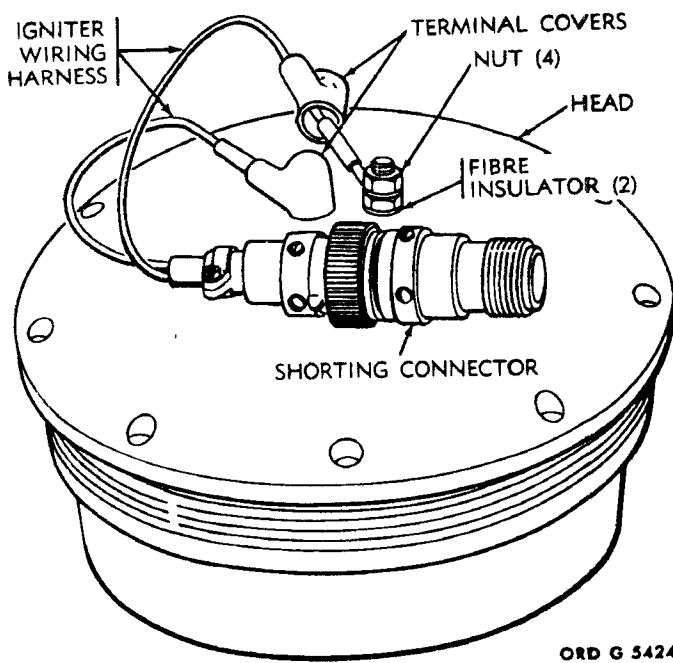


Figure 10-7. Inspection of the rocket motor igniter for corrosion.

Note. On igniter M24A1, lots prior to RAD 3-1 only, apply fungus-proof varnish as prescribed in steps (1) through (4) below. Do not apply the varnish to igniters M65 or M69.

Caution: When performing step (1) below, exercise care to avoid pulling on the wires of the connecting harness.

- (1) Pull the terminal covers back on the igniter wiring harness, and inspect that the nuts on the terminals are tight.
- (2) Carefully clean the head and the terminals with a clean, dry cloth.

Caution: Do not apply the fungus-proof varnish to the igniter wiring harness connector or the shorting connector.

- (3) Apply fungus-proof varnish to the terminals, and allow them to dry.
- (4) Push the terminal covers over the terminals.

c. Prior to testing an igniter, the squib test set 8522168 must be checked as prescribed in steps (1) through (6) below.

- (1) Connect the HERCULES LAUNCHER cable to the TEST RECEPTACLE

of the test set. Set the CIRCUIT SELECTOR switch to the No. 1 position.

- (2) Operate the D.C.-A.C.-CONT. switch to the CONT. position, and hold for a minimum of 30 seconds. The meter indicate 0.39 to 0.50.
- (3) Hold the D.C.-A.C.-CONT. switch in the CONT. position, and momentarily set the CIRCUIT SELECTOR switch to the 2, 3, and 4 positions. The meter indicates 0.39 to 0.50 at each switch position.

Note. If the meter indications in steps (2) and (3) above are not within tolerance, replace the squib test set. Refer the unacceptable squib test set to the supervisor.

- (4) Disconnect the HERCULES LAUNCHER cable from the TEST RECEPTACLE.
- (5) Set the CIRCUIT SELECTOR switch to the No. 1 position.
- (6) Place resistor RW31G280 across the terminals of the IGNITER cable of the squib test set. Be sure the resistor leads make contact. Do not allow the resistor leads to contact the connector shell. Operate the D.C.-A.C.-CONT. switch to the CONT. position, and hold for a minimum of 30 seconds. Record the indication, and remove the resistor.

Warning: The rocket motor igniters must not be tested while installed in the rocket motors.

d. Perform the continuity check of the igniters (view A, fig. 10-8), using squib test set 8522168 and a portable barricade in a suitable area as prescribed below.

Warning: Connect a grounding strap with a maximum resistance of 20 ohm from the portable barricade to a good earth ground.

- (1) Install the attaching ring (view A) on the igniter; put the igniter wiring harness through the hole in the stand. Position the igniter and attaching ring onto the base, and secure with the quick-disconnect fasteners. Close the sliding door.

(2) Remove the shorting connector from the igniter wiring harness.

(3) Connect the igniter cable of the squib test set to the igniter wiring harness.

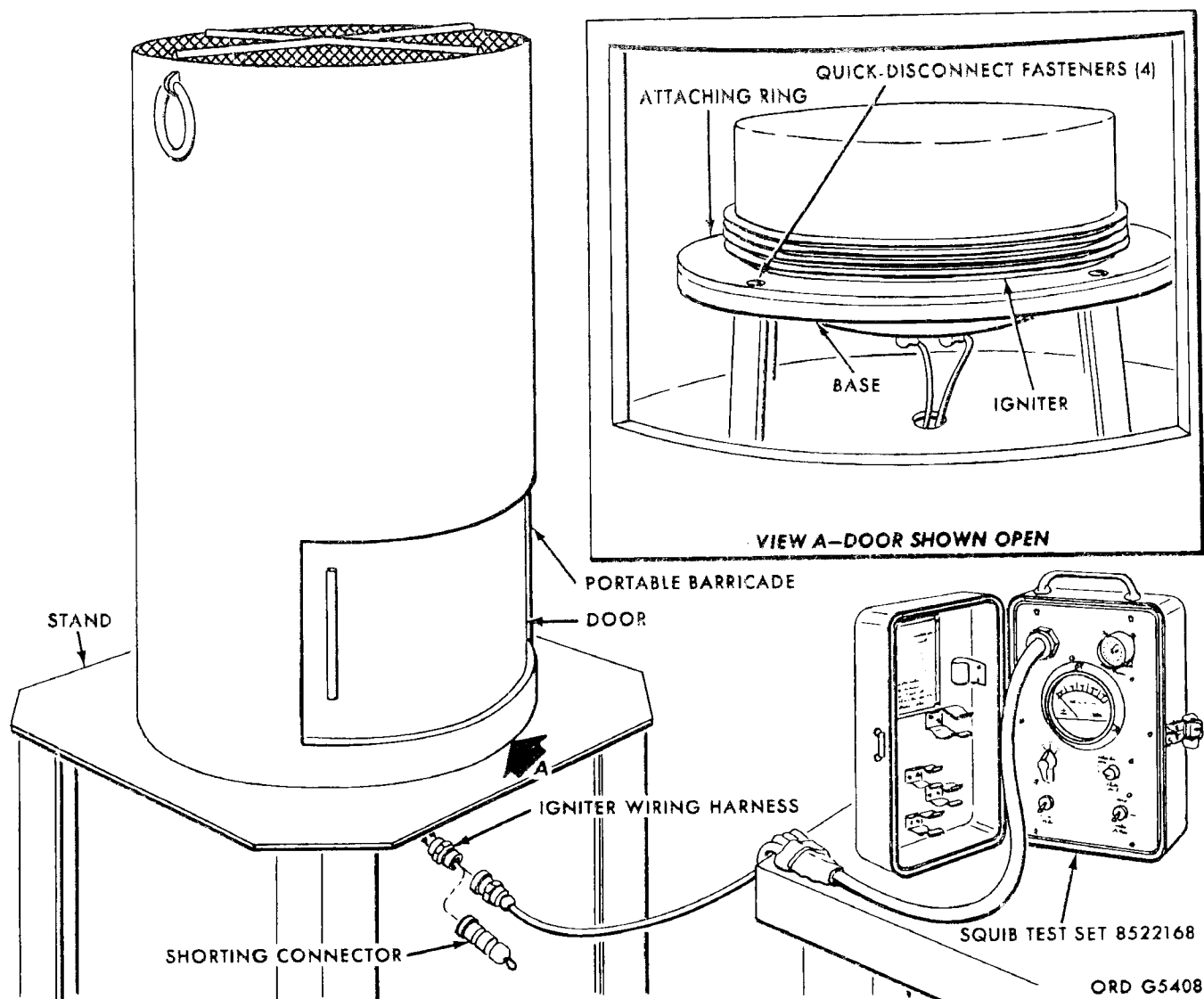


Figure 10-8. Test of the rocket motor igniter.

Warning: Before proceeding with the test, insure that the sliding door on the barricade is closed and the area is clear of all excess personnel.

- (4) Operate the D.C.-A.C.-CONT. switch to the CONT. position, and hold for a minimum of 30 seconds. The meter indicates from 0.38 to the indication established in *c*(6) above. Igniters that do not indicate within the specified tolerance will be rejected and referred to the proper authorities for maintenance.
- (5) Disconnect the IGNITER cable of the squib test set from the igniter wiring harness. Replace the shorting connector on the wiring harness.

- (6) Open the sliding door on the portable barricade.
- (7) Release the quick-disconnect fasteners that secure the igniter and attaching ring to the base, and remove the attaching ring from the igniter. Remove the igniter, being careful not to damage the igniter wiring harness.

Warning: Rocket motor igniters must be inspected and continuity tested prior to installation and semi-annually. The rocket motor igniters must not be tested while installed.

Caution: Do not install the gasket removed in *e* below. The igniter is to be installed without the gasket.

Caution: Install the rocket motor igniter immediately after removal of the shipping plug; the propellant grains absorb moisture if left exposed to the atmosphere.

e. Remove the igniter receptacle shipping closure (A, fig. 10-9) and gasket from the rocket motor.

f. Apply a thin coat of corrosion-preventive compound 6850-880-7616 to the threads of the rocket motor igniter. This is to be accomplished semi-annually to preclude seizure of the igniter in the rocket motor head.

g. Using the spanner wrench, install the rocket motor igniter (view B).

Caution: Visually inspect each igniter to insure that the threads are fully engaged in the head of the rocket motor (view C). The igniters are properly installed when point A of the head of the rocket motor igniter is flush with, or below, point B of the head of the rocket motor.

h. Repeat *a*, *a.1.*, *b*, and *d* through *g* above to test and install each of the three remaining igniters. Upon completion of the last igniter test, repeat *c* (1) through (5) above.

Warning: Before connecting the rocket motor igniter cable assembly to the igniters, make certain that the shorting connector (view D) is installed in P109A of the rocket motor igniter cable assembly.

i. Remove the shorting connector from the rocket motor igniter connector, and connect the rocket motor igniter cable assembly connector to the rocket motor igniter connector.

j. Repeat *i* above for each of the three remaining igniters.

k. Loosen the hexagon nuts (fig. 10-10) on the snubber channel sufficiently to permit the installation of the rocket motor igniter cable assembly.

Caution: The cable assembly can be easily damaged. Exercise care when performing *l* below.

l. Install the cable assembly on the snubber channel, and tighten the hexagon nuts sufficiently to hold the cable assembly in position.

Note. For launching-handling rails (serial numbers 1001 through 1433) which do not have clips for the P109A connector, place the connector inside of the rail-lightening hole adjacent to and aft of the snubber channel. Assure that a minimum length of cable remains outside of the hole to preclude damage to the cable during movement of the missile-rocket motor cluster-rail combination.

m. Install rocket motor igniter cable assembly connector P109A, with the shorting connector installed, in the clips on the launching-handling rail.

Warning: Do not connect rocket motor igniter cable assembly connector P109A to the connector on the launching erecting beam until directed by proper authorities.

10-4.1 Auxiliary Fail-Safe Device Checkout

Note. This procedure is to be performed only when auxiliary fail-safe devices are installed and prior to installation of the M30A1 safety-and-arming devices.

Note. Coordinate with the missile track radar operator in performing the following checks.

Warning: Insure that all M30A1 devices are removed from the warhead section.

a. Set all controls and switches at the section control-indicator (SCI) and launcher control-indicator (LCI) to the initial operating condition.

Warning: When connecting or disconnecting connectors P1X and P72A, the MAIN POWER BKR, MISSILE BATTERY HEAT and BOOSTER HEAT circuit breakers at the launcher power distribution box for the appropriate launcher must be set to OFF.

Warning: Insure that the shorting plug is connected to P109A of the rocket motor cluster igniter cable.

Caution: If the missile firing test set is connected to missiles containing BB401/U batteries, the BATTERY CHARGER switch on the electrical test panel in the section simulator group must remain in the OFF position.

b. Install the missile firing test set equipment group.

- (1) At the SCI, check that the launcher power switch for the appropriate launcher is set to OFF.
- (2) At the launcher power distribution box, set the MAIN POWER BKR circuit breaker to OFF.
- (3) Set the MISSILE BATTERY HEAT circuit breakers to OFF.
- (4) Set the BOOSTER HEAT circuit breakers to OFF, if applicable.
- (5) Position and secure the missile firing sequence test set to the lower front end of the launcher-erecting beam.
- (6) Connect connectors P1Y and P72B of the missile firing sequence test set to receptacles J1G and J72D, respectively, on the erecting beam.

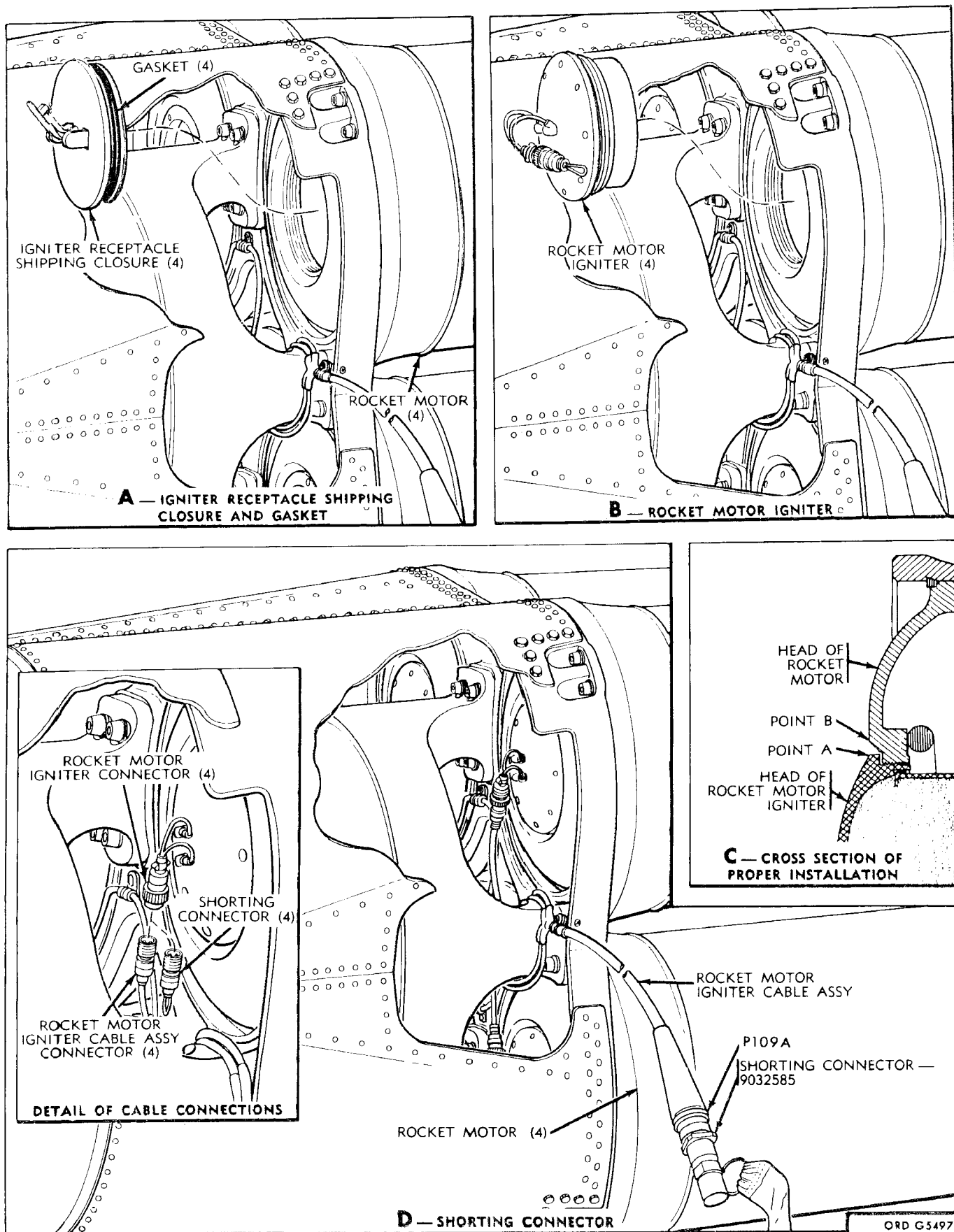


Figure 10-9. Removal and installation of the rocket motor ignitor.

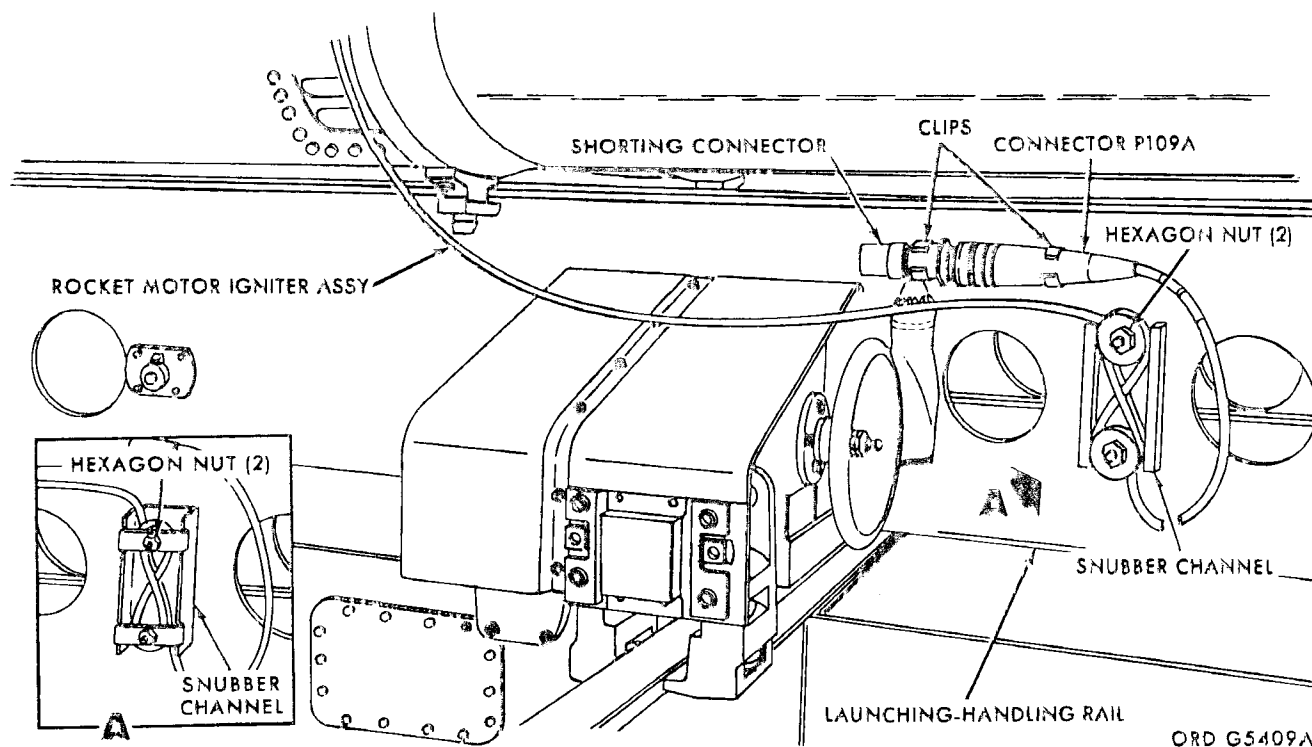


Figure 10-10. Rocket motor igniter cable assembly stowed on the launching-handling rail.

- (7) Connect connectors P1X and P72A of the launching-handling rail to quick-disconnect receptacles J1K and J72E, respectively, on the missile firing sequence test set.
 - (8) Open the cover on launcher-squib connector J109A, and connect connector P109C of the missile firing sequence test set to J109A.
 - (9) Connect cable assembly 9019558 between the missile firing sequence test set and the firing sequence indicator.
 - (10) At the launcher power distribution box, set the MAIN POWER BKR circuit breaker to ON.
 - (11) Set the MISSILE BATTERY HEAT circuit breakers to ON.
 - (12) Set the BOOSTER HEAT circuit breakers to ON, if applicable.
- c. At the SCI, set the LAUNCHER POWER switches and all of the INTER COMM switches to ON.
 - d. At the firing sequence indicator, set the MISSION switch to SS—SA.
 - e. Depress the ON push switch.
 - f. Remove the access door from the forward warhead section.
 - g. Remove connector P616 from the safety-and-arming switch, on branched wiring harness 9020714, in the warhead section.
 - h. At the LCI, set the TEST-FIRE switch to TEST.
 - i. Set the HEATERS & GYROS and VIBRATOR switches to ON, at the LCI.
 - j. Confirm that the missile track radar operator is receiving the missile beacon.
 - k. Using a multimeter set for 20,000 ohms per volt on the 500 volt dc scale, place the leads on the aft connector of the M30A1 safety-and-arming device mounting plate (aft pin—plus, forward pin—minus).
 - l. Verify that no voltage or less than 20 volts dc stray voltage is indicated on the multimeter.
 - m. Request the missile track operator to send a burst command on a short count. Verify a voltage reading on the multimeter of 250 to 325 volts dc.
 - n. Set the VIBRATOR switch to OFF then to ON.
 - o. Confirm that the missile track operator is receiving the missile beacon. Verify that no voltage or less than 20 volts dc stray voltage is indicated on the multimeter.
 - p. Set the VIBRATOR switch to OFF.

Note. When the VIBRATOR switch is set to OFF or the missile track operator has stopped receiving the missile beacon, the multimeter will indicate 250 to 325 volts dc and will decay to 0 or stray voltage level after normal fail-safe time has elapsed.

q. Remove the multimeter leads from the aft connector and reconnect the leads to the forward connector (aft pin-plus, forward pin-minus).

r. Set the VIBRATOR switch to ON.

s. Verify that no voltage or less than 20 volts dc stray voltage is indicated on the multimeter.

t. Request the missile track operator to send a burst command on a short count. Verify a voltage reading on the multimeter of 250 to 325 volts dc.

u. Set the VIBRATOR switch to OFF, then ON.

v. Confirm that the missile track operator is receiving the missile beacon. Verify that no voltage or less than 20 volts dc stray voltage is indicated on the multimeter.

w. Set the VIBRATOR switch to OFF.

Note. When the VIBRATOR switch is set to OFF, or the missile track operator has stopped receiving the missile beacon, the multimeter will indicate 250 to 325 volts dc and will decay to 0 or stray voltage level after normal fail-safe time has elapsed.

x. Set HEATERS & GYROS switches to OFF.

y. Depress the OFF push switch at the firing sequence indicator.

z. At the SCI, set the LAUNCHER POWER switch and all of the INTER COMM switches to OFF.

aa. Set the BOOSTER HEAT circuit breakers to OFF.

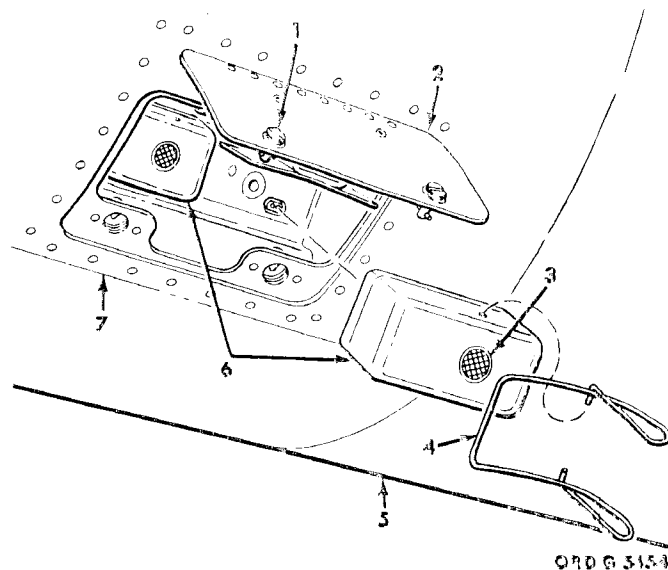
ab. Set the MISSILE BATTERY HEAT circuit breakers to OFF.

ac. At the launcher power distribution box, set the MAIN POWER BKR circuit breaker to OFF.

ad. Remove the missile firing test set equipment group from the missile.

ad.1. Connect connector P616 to the safety and arming switch on branched wiring harness 9020714 in the warhead section.

ae. Replace the access door on the forward warhead section.



- 1—Captive stud fastener (2)
- 2—Arming mechanism access cover plate
- 3—Inspection window
- 4—Bail
- 5—Warhead body section
- 6—Safety-and-arming device
- 7—Bottom centerline

Figure 10-11. Removal and installation of the safety and arming device.

10-5. Installation of Safety-and-Arming Device M30A1

Warning: The safety-and-arming devices are installed in the missile when the missile is in the launching area.

Warning: Exercise care in handling each safety-and-arming device. Always handle with the inspection window facing the handler and the base pointing away from the body.

Warning: If the safety-and-arming devices indicate an armed (red field) condition, remove the devices to a suitable isolated area, and notify explosive ordnance disposal personnel. Do not continue with the installation procedures.

a. Check the color visible through the inspection window (3, fig. 10-11) of each safety-and-arming device. If white is visible, the device is in a safe condition. If red is visible, the device is armed.

b. Remove the bails (4, fig. 10-11) from the safety-and-arming devices, and retain the bails for deactivation purposes.

c. Using an inspection mirror, inspect the contact pins (B, fig. 10-12) for the presence of corrosion and for distortion. Devices with corroded or distorted pins will be rejected and replaced with serviceable devices.

Note. Prior to using arming mechanism ohmmeter with two-lead test cable 8020265, check the battery condition by shorting the ohmmeter terminals, using both test leads. If the maximum needle deflection is to the left of the 16-ohm graduation on the upper scale, the battery should be replaced. Any deflection to the right of the 16-ohm graduation should be considered a full-scale deflection when performing this test.

c.1. Test each safety-and-arming device for electrical noncontinuity (open circuit), using arming mechanism ohmmeter 8020264 and a portable barricade in a suitable area as described in (1) or (2) below.

Note. Do not use procedure (1) if test cable 8030966 is available.

(1) Use of two-lead test cable 8020265.

(a) With the safety-and-arming device (B, fig. 10-12) located in a portable barricade, attach the alligator clips of the two arming mechanism ohmmeter leads to the contact pins of the safety-and-arming device; insure that the uninsulated portion of the test leads do not touch each other or the safety-and-arming device. Feed the test leads through the hole in the bottom of the barricade. Close the door of the barricade.

(b) Touch the opposite ends of the test leads to the terminal posts on top of the arming mechanism ohmmeter. The meter should indicate an open circuit (no deflection of the needle).

(c) Open the door of the portable barricade. Remove one alligator clip from the contact pin, and attach it to the alining pin. Close the door of the portable barricade.

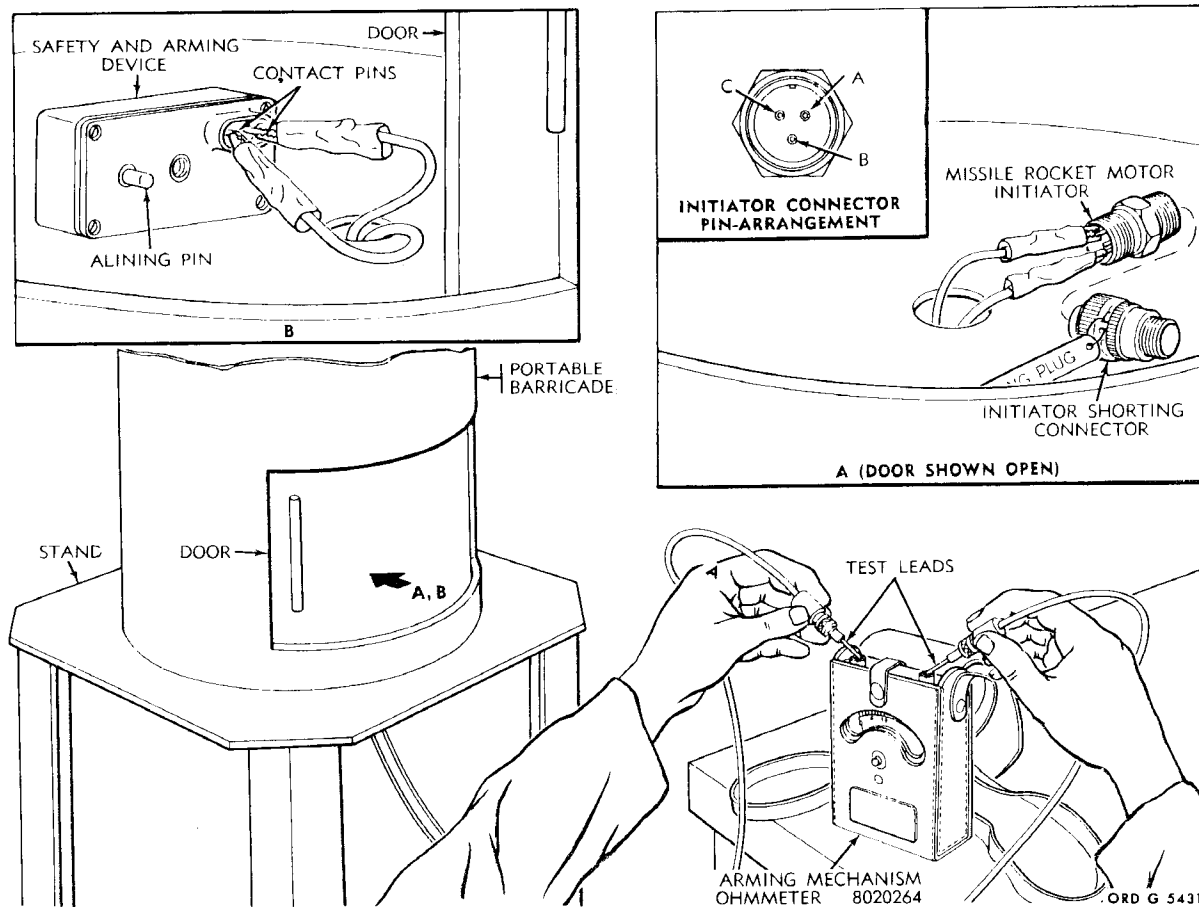


Figure 10-12. Test of the safety-and-arming device.

- (d) Touch the opposite ends of the test leads to the terminal post on top of the arming mechanism ohmmeter. The meter should indicate an open circuit (no deflection of the needle).
 - (e) Open the door of the portable barricade. Remove the alligator clip from the first contact pin, and connect to the second contact pin. Close the door of the portable barricade. Repeat step (d) above.
 - (f) If the needle deflects during any of the above steps and the connections were properly made, the device is to be rejected, and the proper authorities notified.
 - (g) Disconnect the arming mechanism ohmmeter leads from the safety-and-arming device.
 - (h) After the last test is complete, test the ohmmeter by shorting the terminal using the test leads. If the deflection is to the left of the 16-ohm graduation, replace the batteries and perform (a) through (g) above.
- (2) Use of the three-lead test cable 8030966.
- Note.* Some three-lead test cables used in (a) through (g) below have a lead with clear sleeving in place of a lead with red sleeving. The lead with clear sleeving should be used in procedures calling for use of the red lead.
- (a) Prior to using the cable, perform the following continuity and battery test with the arming mechanism ohmmeter.
 1. Check for continuity between the alligator clip and the red test lead probe. If the maximum needle deflection is to the left of the 16-ohm graduation on the upper scale, the battery should be replaced. Any deflection to the right of the 16-ohm graduation should be considered a full-scale deflection when performing this test.
 2. Install a shorting wire between the connector assembly receptacles.
 3. Check for continuity between the black and white probes.
 - (b) With the safety-and-arming device located in the portable barricade, attach the connector assembly to the receptacle on the base of the arming device, and attach the alligator clip of the red test lead to the aligning pin on the arming device.
 - (c) Feed the other end of the test leads through the holes in the bottom of the portable barricade and close the door.
 - (d) Touch the probes of the white and black test leads to the studs on the arming mechanism ohmmeter. The meter should indicate an open circuit; there is no deflection of the needle.
 - (e) Release the white test lead and the black test lead.
 - (f) Touch the probes of the red and black test leads to the studs of the arming mechanism ohmmeter. The meter should indicate an open circuit; there is no deflection of the needle.
 - (g) Touch the probes of the red and white test leads to the studs of the arming mechanism ohmmeter. The meter should indicate an open circuit; there is no deflection of the needle.
 - (h) After the last test is complete, test the ohmmeter in accordance with (a) above. If the ohmmeter fails the test, replace the batteries and perform (a) through (g) above.
- d. Release the captive stud fasteners that secure the ARMING MECHANISM access cover plate, and open the cover plate.

e. Insert the two arming devices into their receptacles.

f. Close the access cover plate, and secure with the captive stud fasteners.

WARNING: When connecting or disconnecting connectors P1X and P72A, the MAIN POWER BKR, MISSILE BATTERY HEAT, and BOOSTER HEAT circuit breakers at the launcher power distribution box for the appropriate launcher must be set to OFF.

g. Connect PIX and P72A to the launcher erecting beam.

10-6. Inspection and Alignment of the Ram-Pressure Probes

a. Remove the closure (6, fig. 3-31) from the ram-pressure probe tube.

b. Position the ram-pressure probe alignment template (fig. 2-1) over the forward fin assembly, approximately 6 inches forward of the rear edge of the saddle.

Note. It may be necessary to hand-fit the template ellipse over the fin assembly.

c. Manually slide the template to the rear, while holding it perpendicular to the missile center line, until the tube protrudes approximately 1/16 inch through the circular cutout. The end of a serviceable probe will fit in the circular cutout.

d. If the end of the tube does not fit in the circular cutout, align the tube as outlined in (1) and (2) below.

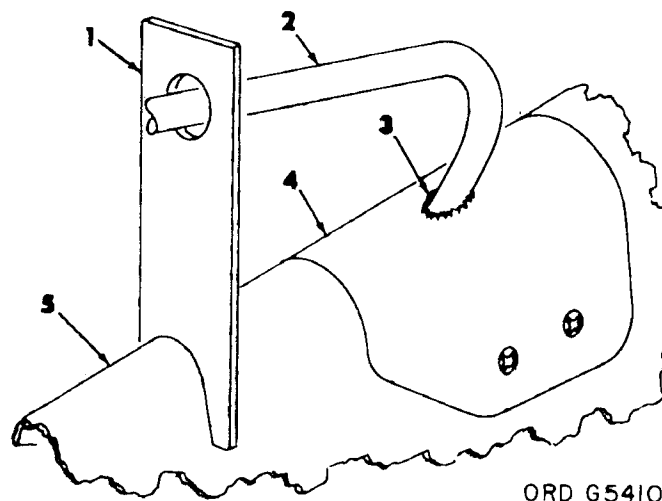
CAUTION: The probe tube is brazed in the saddle. To prevent damage to the brazing when bending the tube, rubber tape must be wrapped around the tube just above the brazing, and the taped portion of the tube must be held in position with pliers.

(1) Using rubber tape 5970-184-2002, wrap the tape around the tube just above the brazing and hold in position with pliers.

(2) Using hand pressure, bend the tube until the end of the tube fits within the circular cutout in the template.

e. Remove the template and tape, and install the closure (6, fig. 3-31) on the tube.

f. Repeat steps a through e above for the remaining tubes.



- 1—Ram-pressure probe alignment template
- 2—Ram-pressure probe tube
- 3—Brazing
- 4—Saddle
- 5—Forward fin assembly

Figure 10-13. Ram-pressure probe alignment check.

